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Potential Value of Expiratory Carbon Dioxide Measurement in Patients Considered to Be Susceptible to Malignant Hyperthermia

To the Editor:—Anesthetic management of patients suspected to be susceptible to malignant hyperthermia (MH), in the absence of reliable tests to diagnose or rule out susceptibility to MH,¹ obviously should include monitoring optimal for early diagnosis of MH. Consequently, we propose that continuous monitoring of end-tidal carbon dioxide concentration offers a rapid, reliable, and noninvasive measurement of elevated carbon dioxide production, which may be one of the early clinical signs of impending MH.

Gronert and Theye found that the metabolic and hemodynamic changes with porcine MH are associated with an increase in mixed venous P_{CO_2} (P_{vCO_2}) which is one of the early clinical indicators of the increased metabolism typical of MH.² In this model, high carbon dioxide production, as reflected by the rising P_{vCO_2} , was a consistent early sign of impending MH. Furthermore, once treatment was begun, the decrease in P_{vCO_2} seemed to indicate the effectiveness of therapy.³

Changes in carbon dioxide production should be reflected by corresponding changes in carbon dioxide output, as measured by end-tidal carbon dioxide concentration, provided that minute volume ventilation is constant and anesthetic depth stable. Therefore, monitoring of end-tidal carbon dioxide concentration in MH-susceptible patients could be of value for early detection of MH, and thus for early institution of proper therapy and for assessment of the effectiveness of such treatment. Monitoring of expiratory CO_2 might prove to be more reliable than, for example, body or carbon dioxide absorber temperatures, which may be relatively late signs, or an in-

crease in heart rate, which may be caused by factors other than MH, or blood P_{CO_2} when ventilation is not constant.

We recognize that these expectations are based on data derived from the porcine model of MH, that there are only a few reports of metabolic changes in human MH.⁴ Obviously only continuous monitoring of expiratory carbon dioxide concentration during anesthetic management of patients suspected to be susceptible to MH can substantiate our expectation of its clinical value.

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Conclusions Concerning "Differential Sensitivities of Nerve Fibers to Local Anesthetics" May Not Be Justified

To the Editor:—Drs. Gissen, Covino, and Gregus¹ have published a very interesting paper that I am sure will stimulate great controversy. However, their conclusion "that local anesthetic agents are similar to other biological stress modalities in terms of their differential effects on nerve fibers of various sizes and conduction velocities, e.g., the large fast-conducting fibers are more susceptible to conduction blockade than are the smaller,

slowing conducting fibers" is not warranted by their study. The following points should be considered when reading the Gissen *et al.* article.

Their endpoint of a 50 per cent reduction (ED_{50}) in the amplitude of compound action potentials, originated in populations of nerve fibers with greatly different speeds of conduction, is the only objective measurement to compare the effect of local anesthetics on A and C